ARB STAFF RESPONSES TO COMMENTS ON TP-201.5 RECEIVED AFTER MARCH 4, 1999 WORKSHOP

Comments on TP-201.5 are grouped as follows:

- A/L Test Variables
- New A/L Ratio Determinations
- Roots Meter
- Vacuchek/Vacusmart
- Other
- Editorial

A/L Test Variables

1. Comment: The amount of fuel delivered will effect the A/L reading on the VaporVac system due to the "Puff" feature which allows the vapor pump to run at a higher speed during the initial part of the delivery. We have found that the A/L reading is on the average approximately 0.04 higher when a 4.5 gallon delivery is made versus a 7.5 gallon delivery.

Response: BAAQMD field tests between the existing TP-201.5 and ST-39, which is very similar to the proposed revised TP-201.5, indicated an average A/L difference of 0.02. Based on a similar earlier comment, ARB staff repeated the method comparison at a Sacramento station and obtained results similar to that of the BAAQMD. These differences were not considered significantly different according to the statistical tests obtained from the USEPA Method 301 comparison protocol.

2. Comment: There can be some residual fuel in the vapor passageway of the coaxial hose from a previous delivery top-off. This fuel can make the first A/L reading lower than the subsequent readings.

Response: The system is required to clear the vapor passage for each refueling. The revised procedure allows the average of three refuelings if the first fueling fails by less than 0.10 outside the allowable A/L range. We do not believe this increases the stringency of the test procedure. If you have data showing that a first A/L test of more than 0.10 outside the allowable range can be shown to be in compliance by averaging with two subsequent A/L runs, please provide this data to ARB.

3. Comment: We have found that running A/L tests can increase the pressure in the UST and this pressure can effect the A/L reading. For example, our testing indicates at a product flow rate of 8 GPM the A/L reading can be reduced by approximately 0.06 with an increase of 3 inch W.C. pressure. Will a correction factor be allowed for this increase in backpressure?

Response: No. The A/L ranges for Phase II systems are determined by running the A/L test during certification. Based on ARB experience, ARB staff find that the A/L window in the appropriate Executive Order for the affected systems are sufficient to address this concern.

The vapor recovery system specified P/V vent will not allow the vapor recovery system to exceed design pressure limits due to A/L testing.

4. Comment: This test equipment does not provide a means to control or measure the hydrocarbon, "HC", level being ingested by the rotary gas meter. We have found that the concentration of HC vapor being recovered effects the A/L reading as follows:

Hydrocarbon Level at Roots Meter Inlet	A/L Ratio Reduction
15%	- 0.02
30%	- 0.04
45%	- 0.06

Response: Staff has made modifications to the procedure (Section 9.6) to initialize the test tank with saturated HC-air mixture to minimize variation due to HC concentration differences.

5. Comment: Provide a complete BOM for the fittings used. It has been noted that a hose barb fitting (NPT to flexible hose fitting) ID can vary from each manufacturer regardless of NPT designation.

Response: Staff has made revisions to standardize the test equipment. For example, fitting and hose IDs have been changed from ranges or minimums to specific values.

6. Comment: Provide a seal where the nozzle "air to liquid" adapter interfaces with the portable test tank. This will prevent HC vapors from escaping at this point rather than passing through piping to the Rotary Gas Meter.

Response: A seal is possible, but not required. ARB staff is developing A/L adapter criteria to promote A/L testing consistency.

7. Comment: As the portable tank is being drained, it will ingest a volume of air that is equivalent to that of fuel being drained. This effects the vapor concentration being routed to the Roots meter, which effects the A/L readings as stated above. Our testing has shown that at a flow-rate of 6.0 GPM, it takes a least two transactions for the hydrocarbon concentration to increase to a point where it will level off, thus providing more consistent hydrocarbon level being ingested by the Roots meter. A solution may be to connect the test tank vapor space to the vapor space of the UST so that vapors are recirculated in the test tank rather than air as it is emptied, ie. A mini-Phase I delivery. This would also help prevent pressurizing the UST when the fuel is returned to the UST from the test tank.

Response: ARB CD staff have tried this technique, but it led to inconsistent A/L results. We will investigate further as we agree there are emission and testing benefits to this approach.

8. Comment: My concern relates to the effects of fuel in the vapor return lines. We are reducing the test run from 7.5 to 4.5 to 5 gallons. Reducing the test run, coupled with averaging the A/L ratio over the run, may not be enough time to evacuate the fuel and give a true A/L reading. The test procedure does not refer to checking for fuel in the vapor return lines, which we know affects the A/L settings. When we were in Chicago running tests, I would say 60% of the people topped off their tanks. We measured amounts between 10 ml and 35 ml of fuel in the lines after this happened. I am afraid that with the reduced throughput of the hose, it will not give enough time to properly remove this residual fuel and consequently give a low reading. You may want to run some amount of fuel through the nozzle before performing the A/L test.

Response: A/L tests should be run in the "as found" condition. Dispensing episodes of 4.5 to 5 gallons are not unusual and pose testing advantages (5 gallon containers can be used). The issue is whether A/L test biases due to improper use of the vapor recovery equipment by the customer (topping off) are or should be accounted for in the A/L range developed during certification tests.

9. Comment: The hose lengths associated with the test tank should be made as short as possible.

Response: Hose lengths are patterned after BAAQMD ST-39. The vapor line from the portable gasoline tank to the volume meter supply piping will remain between 10 (min.) and 14 (max.) feet long. BAAQMD indicated that minimum/maximum length restriction was needed to condition the gasoline vapors for consistent A/L results.

10. Comment: The maximum height above ground of the test tank fill pipe opening should be specified. Currently, some contractors use tanks on trucks. The hose is raised which brings any liquid columns in the hose closer to the top of the dispenser. This makes it easier to clear liquid from the lines and changes the flow resistance experienced during normal vehicle fueling operations.

Response: Staff has no data to evaluate on this item. Any available data would be welcome. The resistance may be reduced slightly (few inches of water column) by raising the nozzle about a foot or two. Where this would be significant would be a rare borderline (i.e. almost malfunctioning) vapor return system. Most vapor pumps pull a relatively large vacuum because they are expected to clear any liquid from the vapor lines and would not be affected by raising the nozzle a couple of feet. Also, most A/L failures cannot be corrected by raising the nozzle a couple of feet.

New A/L Ratio Determinations

11. Comment: Please involve us in the testing of our system to determine the new A/L ratios for our Executive Order.

Response: We will notify all manufacturers who have an A/L requirement in their Executive Order regarding testing using the new procedure to determine whether a new A/L range is needed.

12. Comment: Gas densities were shown to have significant impacts on the Hasstech and Healy system V/L ratios. There is an immediate need for correction factors for these systems, especially the Healy units. Most districts do not have Roots meters, so it is requested that the ARB also develop correction factors as soon as possible for the Vacucheck, Vacusmart and the Bay Area's rotameter devices for use on Healy systems.

Response: ARB staff will conduct testing to determine correction factors where needed for all certified systems with A/L testing requirements. These correction factors will be incorporated in the certification Executive Orders and/or the appropriate alternate test method. No correction factors are needed at this time to conduct the currently adopted A/L test or it's equivalent test procedures.

Volume Gas Meter

13. Comment: Include information on Roots meter calibration testing and requirements and information on saturating the test tank for new test requirements.

Response: Gas volume meter (Roots meter) calibration requirements and recommendations have been included in Sections 8.1.1 and 8.1.2. Saturating the test tank and the rest of the test equipment are addressed in Section 9.6.

14. Comment: My rotary meters cannot meet the 1% accuracy specified by the method in the range needed to conduct TP-201.5.

Response: Specification will be relaxed to "± 5% of volume measured", which is consistent with ARB Air Monitoring Quality Assurance for Stationary Source Emission Monitoring and Testing for rotary meters (Section 6.7, Table 3).

15. Comment: The volume gas meters should be calibrated within 180 days prior to conducting this procedure.

Response: Annual calibrations for volume meters (including rotary meters) is consistent with ARB Air Monitoring Quality Assurance for Stationary Source Emission Monitoring and Testing (Section 6.7, Table 3) and USEPA Quality Assurance Handbook for Air Pollution Measurement Systems, Volume III, Stationary source specific methods. More frequent calibration is acceptable.

16. Comment: The rotary gas meter shall be calibrated at flowrates of 30, 60 and 90 CFH.

Response: The annual calibration should be five points over a range exceeding the range required to perform the method. ARB staff estimates that range to be between 25 and 250 CFH. This is specified in Section 8.1.2 of the proposed TP-201.5. The current upper working range can be derived from the highest allowable fueling rate (10 gallons/minute) and the highest certified A/L (2.4) which gives a flowrate of approximately 193 CFH.

17. Comment: A factor to correct for the volume gas meter error taken from the calibration data at the appropriate flow rate should be included in the calculation of A/L.

Response: A correction factor calculation has been added to Equation 13-1. Equation 13-3 has been added to calculate the correction factor based on NIST-traceable calibrations of the volume gas meter.

18. Comment: Please consider the California State Division of Measurement Standards (DMS) procedure for the calibration of vapor-air flow measurement devices. The method is essentially the same as USEPA's Method 2A. It is far less expensive for districts to have local county departments of weights and measures do the calibrations instead of sending the flow meters to private firms.

Response: Staff will propose the DMS procedure as a calibration option as a 15-day change.

Vacuchek/Vacusmart

19. Comment: This procedure should also include information required for the use of the Hasstech Vacusmart. If the Hasstech Vacusmart system will become an official test system when Hasstech converts their original system to meet this new criteria through Section 11 Alternate Test Procedures, then all manufacturers that this system is used on should be a party to the approval process of this system. The Alternative Test procedure should then become an official test procedure document (TP201.5.A) or a section of TP-201.5 so everyone would know how to locate the information. If any other Alternative Test Procedure is considered under Section 11, then all manufacturers that would be affected by the new test procedure should be included in the approval of the test procedure.

Response: Alternate test procedures such as the Hasstech Vacusmart are patented and their test procedures are copyrighted. Legally, we cannot include them in TP-201.5 or as another test method. ARB equivalency determinations are made by ARB staff using USEPA protocols. Information on vapor recovery method equivalency determinations is posted on the ARB website at "www.arb.ca.gov/testmeth/vol2/eq_down.htm".

20. Comment: We found that the Hasstech testers work very well for field testing, although ARB staff have mentioned some problems with these units. If there have been problems with repeatability, was any thought given to giving a wider tolerance based on the use of these testers? Based on CARB certification, we even mention these testers in our owner's manual. Now we have a dilemma because I am assuming they are not certified.

Response: Hasstech Vacucheck and Vacusmart are approved alternatives to TP-201.5 for certain vapor recovery systems. Problems encountered with these units appear to be related to misunderstanding the instructions or need for calibration or repair of the instrument. ARB comparison tests between TP-201.5 and the Hasstech units showed equivalency in the test results as per application of statistical tests contained in USEPA Method 301. Additional

information on the use of the Hasstech instruments and systems for which equivalency was established can be found at www.arb.ca.gov/testmeth/vol2/eq_down.htm.

21. Comment: In determining equivalency between TP-201.5 and the use of the Vacucheck or Vacusmart, gas density differences make a difference when testing all systems, including the Gilbarco and WayneVac systems. During the recent field survey, a contractor using a Vacusmart unit at a WayneVac pump obtained A/L readings of 0.89, abort, 0.89. He then changed the nozzle. The readings were 0.90, 0.90 and 0.92. He sold the dealer a new nozzle. The next day a test was run with a Vacucheck unit. The A/L was 0.88. The problem wasn't caused by the nozzle. Similar problems occurred with the A/L testing using the specified volume gas meter. The first readings tended to be lower than the subsequent values. In these cases, what occurred was the drying of liquid clinging to the walls of the vapor line. As the lines dried out, the gas density approached the lower level of the air density and flow increased due to a decrease in flow resistance. Therefore, it is requested that the procedures for the Vacusmart, Vacucheck and all similar A/L devices be changed so that the hose is conditioned with gasoline vapor before each test run.

Response: The revised TP-201.5 requires "conditioning" the system by simulating an A/L test (see Section 9.5). After adoption of revised TP-201.5, ARB and Hasstech will work together to resolve any issues with the Vacucheck/Vacusmart instruments.

Other

22. Comment: I know this test method has been around for some time. However, over the years, we have developed alternatives. This test was developed as a compliance test and now we are trying to make it the standard for field applications. It is very accurate and I guess the changes were to make it more accurate. It may even use equipment (ie. volume gas meter) that is not susceptible to being carried around in a service truck. I am all for accuracy. However, I also spent 10 years working with our service companies and feel you need to supply tools that work in the environment we deal with.

Response: The volume gas meter method is a good procedure, but not ideal. Ideally, the dispenser should be equipped with instrumentation that monitors A/L automatically and signals when a problem exists. This will be considered in the In-Station Diagnostics proposal to be considered at the December 1999 Board meeting.

23. **Comment:** Section 4.5 should include the language "and the nozzle shall be immediately removed from service" at the end of the sentence. This goes beyond a DMS issue because the nozzle is not performing as certified and can be a hazard to any person attempting to use it.

Response: Section 4.5 now reads, "If the nozzle being tested introduces liquid into the vapor portion of the test equipment, the A/L of that nozzle shall be deemed a failure." Staff's position is that test procedures are measurement tools and should not specify enforcement actions.

Editorial

24. Comment: Replace the sentence “The tank and recommended plumbing configuration is shown in figures 30\9-2 and 39-3 with the following, “an example of a tank and the recommended plumbing configuration is shown in Figures 2 and 3.”

Response: Most of TP-201.5 was copied from BAAQMD test method ST-39. Figure numbers and other BAAQMD ST-39 designations have been changed.

25. Comment: Summary of Source Test Results Form

- the header identifying this form needs to be corrected to read Form 2, not Form 39-2.
- the page identification footer needs to be corrected to remove ST 39-12.
- the Source Information label is covered by border lines
- the BAAQMD representatives label is covered by border lines, correct label
- the middle of the form states "Source Test Procedure ST-39", correct to TP-201.5

Response: The Summary of Source Test Results Form has been removed. It is redundant to the A/L Field Data Sheet.

26. Comment: Section 5.4 - The third from the last sentence should read, "An example of a tank and the recommended plumbing configuration is shown in Figures 2 and 3."

Response: Section 5.4 is now Section 7.6. The sentence now reads "See Figure 2 or 3 for an example of the tank configuration."

27. Comment: Please indicate changes in the revised test procedures by including the effective date of the item and the area changed so that someone can easily pick up what has been changed in the procedure when they are comparing the old and the new.

Response: Staff feels it is clearer in this case to present the revised A/L method without strikeout and underline as there are so many changes to this method. Staff who reviewed the strike-out and underline version found it confusing and lost continuity in their review.

28. Comment: Figures should be expanded to the full size of the window.

Response: All figures will be moved to the end of the test procedure and enlarged if possible.